

## A NEW GENUS OF PRIMITIVE MELOIDAE FROM WEST TEXAS (COLEOPTERA)<sup>1</sup>

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The beetle described here is the most unusual meloid I have ever encountered. When Henry Howden sent me a male, several years ago, I examined it and placed it among the unidentified pedilids. But re-examination in relation to the pedilids convinces me that it is indeed a meloid, and probably one of considerable evolutionary interest. Since I first saw a specimen, Richard Selander (1966) has published a comprehensive study of the meloid subfamily Eleticinae, which is generally unfamiliar to students of North American beetles. The Eleticinae have some characteristics that are different from those of conventional meloids; part of these are shared by the new genus described here. The Eleticinae are so different from other Meloidae that Selander suggests that relationship would best be indicated if they were set up as a separate family, or as a subfamily of weight equal to one combining all other meloids. But, in the interest of avoiding major changes before relationships are certain, he has (1964, 1966) followed a course of recognizing three subfamilies of Meloidae: Eleticinae, Meloinae, and Nemognathinae, with the Eleticinae considered the most primitive. The group has a disjunct distribution in the Old World (mainly Africa but including a few species in Southeast Asia) and South America, both of the tribes he recognizes in his 1966 paper having members on both sides of the Atlantic. This relict type of distribution certainly supports his opinion that this is an ancient group. Unfortunately, there are no observations on the behavior of the subfamily, and the larval associations that have been made are based on supposition rather than observation. So only adult structures can be used in classification.

Perhaps the single thing that is most meloid-like about the insect described here is the shape and conformation of the head (Fig. 2, 3). The only thing that is unusual at all is that the eyes are more coarsely faceted than is usual for the family. The general body shape (Fig. 1) is also not greatly different from that of some other meloids; the main points of difference are those of the Eleticinae: cuticle much firmer

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than usual and elytra conjointly rather than separately rounded. To these features must be added a uniform brown coloration, unusually small size, less than 5 mm, quite dense and deep punctures over the whole dorsal surface, and moderately dense, fine pubescence, all unusual for the family but found in some Eleticinae.

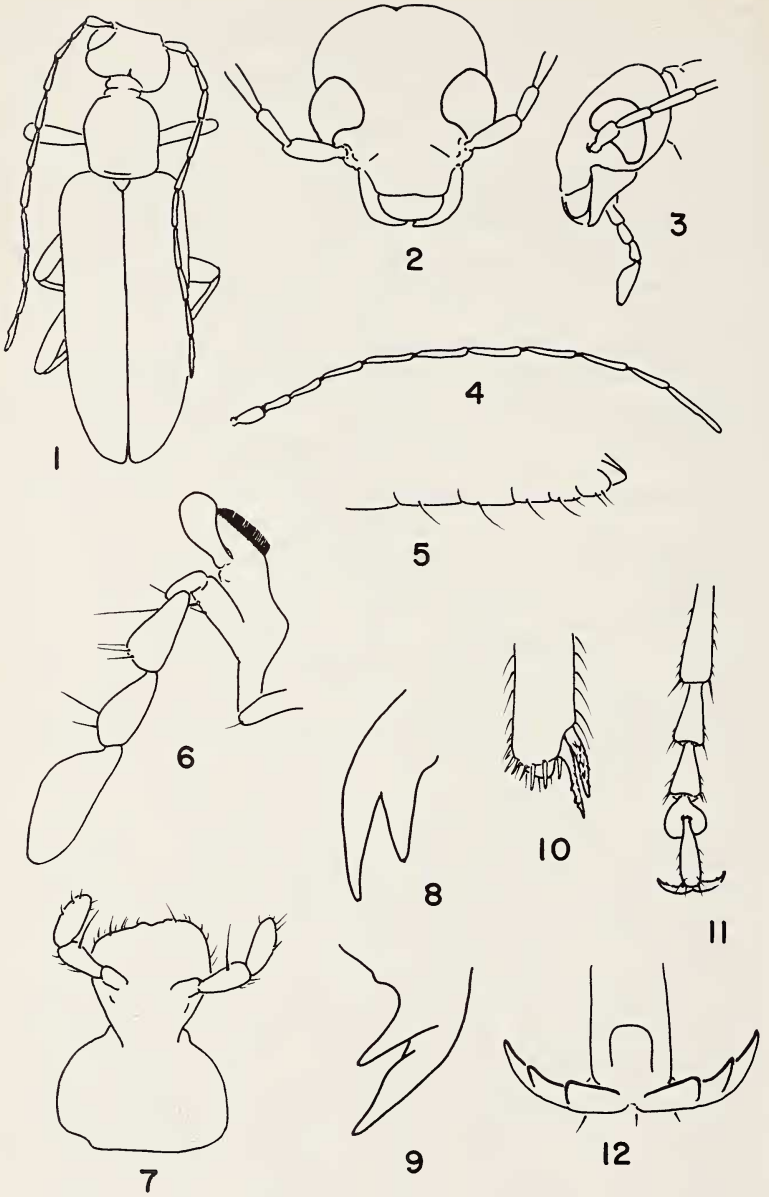
The combination of these features and lack of a separate blade on the tarsal claws would make identification of the genus as a meloid almost impossible with existing keys to the family, even if one had a good representation of other genera for comparison. In fact, I have tried repeatedly to find reasons for excluding it from the family, but have then been faced with the decision that it is more like meloids than it is like any other family known to me. So I am describing it as a meloid, possibly assignable to the subfamily Eleticinae, but not definitely assignable to this subfamily nor to either of the included tribes recognized by Selander (1966). It is my hope that the existence of a population in a relatively accessible location will ensure that both bionomics and behavior will come under study and that these will permit more exact assignment.

Since it is almost inevitable that comparison will be made with the Eleticinae and that Selander's 1966 paper will provide the basis for comparison, I have attempted to follow Selander's terminology and his pattern of description. However, I have not attempted to review the whole subfamily, and therefore may have strained too far to see structures that are obvious in the subfamily and not necessarily in this genus. The bases for measurement also follow Selander's paper.

#### Genus *Thambospasta*, new genus

Characteristics. Small, less than 5 mm, slender beetles (Fig. 1) of the family Meloidae and doubtfully of the subfamily Eleticinae as defined by Selander (1966); monochromatic brown; head, pronotum, and elytra densely, moderately deeply and moderately finely punctate; with simple slightly curved decumbent setation, also monochromatic. Mentum, palpi, coxae, trochanters, and abdominal sterna (Fig. 5) with single to double, long erect tactile setae, those on mentum and abdomen sublateral. Head just perceptibly longer than broad (Fig. 2); vertex not inflated, its base subtruncate. Eyes moderately large, length  $1 \frac{1}{3}$  frontal ocular distance in male,  $1 \frac{1}{10}$  in female; anterior margin slightly excavated (Fig. 3); facets coarse and separate, ca. 8 across narrowest portion. Antennae slender, filiform; segment X  $1 \frac{1}{5}$  as wide as long (Fig. 4) in male; less slender

in female, segment X  $1/2$  as wide as long. Clypeus separated from frons by a depression only, with a narrow, thin, shiny shelf over base of labrum; labrum flat, not emarginate at apex. Mandibles half as long as head from top of vertex to anterior mandibular articulation; shallowly indented on mesal margin just basad of middle; prostheca moderately long, reaching beyond middle of mesal margin; molar lobe small but distinct; mesal margin without teeth but apex bluntly double-pointed, chisel-like, the mesal face flat for a small zone before apex; lateral margin almost evenly curved from base, with moderately dense setae. Maxillary palpi (Fig. 6) four-segmented, basal segment small, second and third subequal, last long, narrowly securiform. Galea simple, of but one segment. Labium (Fig. 7) with ligula apparently entire, blunt; mentum not strongly produced laterad. Pronotum  $1/5$  longer than wide, ca.  $9/10$  as wide as vertex, feebly subhexagonal in outline; disk feebly convex except for impressed midline. Front coxal cavities open externally, closed internally. Mesosternum obtusely angulate at anterior apex. Mesepisterna in contact medianly; anterior marginal area with a complete curved ridge from dorsal edge to near midline, subparallel to main ridge but converging toward it near midline. Apex of elytra simple in both sexes. Hind wings (Fig. 13) fully developed in both sexes; apical region  $1/3$  wing length; stem of media (M) short but distinct; crossvein r present and radial cell closed; base of  $2A_2$  strongly developed, forming a closed cell ( $1A_3$ ) with a crossvein from  $1A$ ;  $3A_1$  not combined with  $2A_3$ , apparently present as a short branch which with a crossvein from  $2A_3$  forms a closed cell. Male fore tibiae with two unmodified spurs (Fig. 10). Hind tibial spurs slender, essentially equal. All spurs with fine microspines (Fig. 10). Tarsal formula 5-5-4. Penultimate tarsal segment (Fig. 11) forming a flat, truncate lobe, the last segment arising from near middle of its dorsal surface. All tarsal claws with a very blunt basal tooth; those of fore and middle tarsi with a longer pointed tooth in addition (Figs. 8, 9, 12). There is no vestige of a ventrolateral lobe or blade. Abdominal sternum III excavated for hind coxae, the excavation bordered by a fine ridge. Male abdominal tergum VII weakly sclerotized, its apex slightly curved, at least this tergum with a micropubescent area that is not divided on midline. All terga before VII weakly sclerotized; at least part seem to have the same kind of micropubescent. Male sternum VII truncate across apex, simple on disk; tergum VIII evenly sclerotized from very near base, bluntly ogival; sternum VIII sharply angular posterolaterally, its disk simple and its apex just



perceptibly emarginate between the angulations; tergum IX small, undivided and weakly sclerotized; sternum IX Y-shaped with broad lateral arms. Male genitalia (Fig. 14) with gonostyli fused dorsally from base to beyond middle; base of fused gonostyli produced posteriorly on dorsal side in a process that surpasses the gonostyli and bears three dorsal and ca. 9 lateral short, stout setae on each side; gonocoxal plate cupped, ca.  $1/2$  as long as gonostyli. Aedeagus (Fig. 15) long, symmetrical, downcurved toward base, movable in relation to gonostyli; with two oblique lateral ridges on each side toward apex; secondary gonopore apparently apicodorsal; there is no indication of a sclerotized rod or projection from the internal sac in this region; dorsal surface of aedeagus apparently open for most of its length. Female abdominal segment VIII retracted into apex of abdomen, weakly sclerotized, its sternum with a long, slender apodeme (Fig. 17); ovipositor (Fig. 16) well-developed, long, with one-segmented gonostyli.

Type species. *Thambospasta howdeni* new species; fixed by present designation.

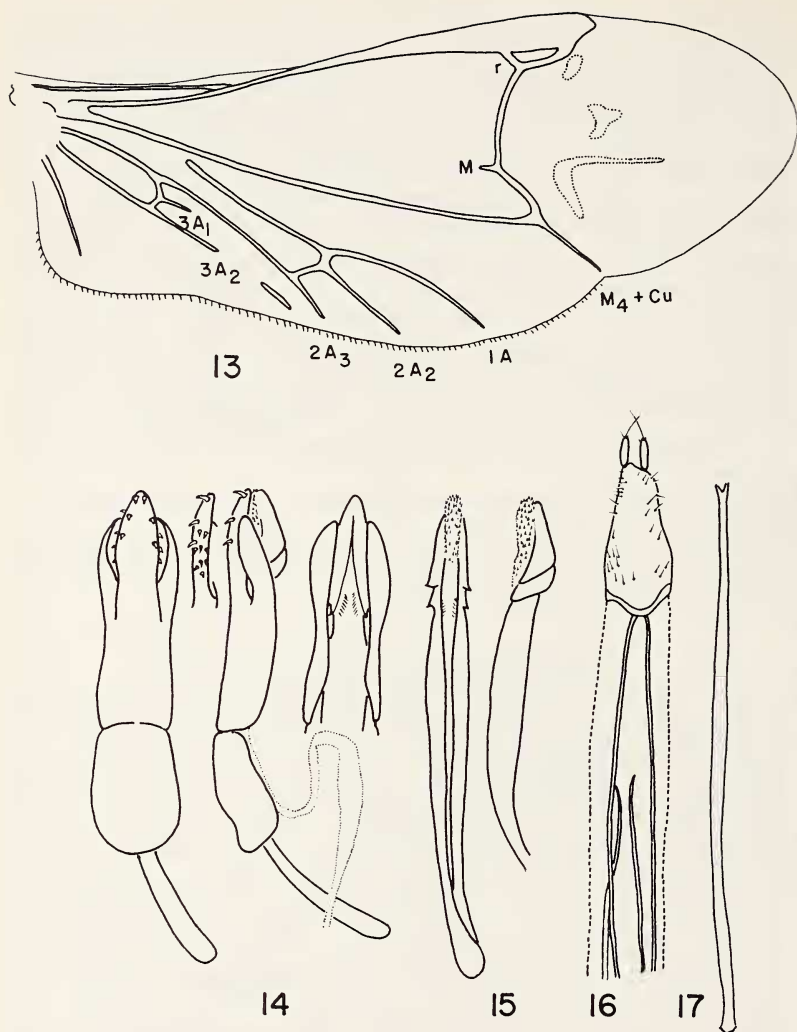
Remarks. This genus contains only the type species, described below. It is known from both sexes.

### *Thambospasta howdeni*, new species

Male. Entirely rufescent brown except for black eyes, only tips of mandibles appreciably darker; pubescence concolorous, fine, and therefore inconspicuous. Length 3.6-4.4 mm, mean 3.88, SD 0.29, holotype 4.4. Surface generally shiny, but deep punctures dull it somewhat. Punctures on head uniform, flat-bottomed, ca. 0.04 mm across, 0.05 center to center, even across midline; midline indicated only as a notch on vertex. Antennal calluses distinct, grading into a small elevation over base of antenna, with punctures like rest of head. Head depressed across front between antennae, in region of frontoclypeal suture, which is not visible, punctures extending evenly across whole region; clypeus ending in a smooth shelf ca. 0.04 mm wide and flat, over base of labrum. Eye facets almost exactly 0.03 mm in diameter, very regularly arranged. Punctures of pronotum just

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Figs. 1-12. *Thambospasta howdeni*. 1, dorsal view of holotype male; 2, head of holotype in front view; 3, same in oblique lateral view; 4, antenna of paratype male; 5, profile of abdominal sterna of holotype; 6, maxilla of paratype male; 7, labium of same; 8-9, pieces of tarsal claws of same; 10, tip of front tibia of same; 11, front tarsus of same; 12, detail of front tarsal claws, ventral view.



Figs. 13-17. *Thambospasta howdeni*. 13, hind wings of paratype male; 14, genitalia of paratype male in dorsal, lateral, and ventral views, with inset of details of median process; 15, aedeagus of same in dorsal and left lateral views; 16, ovipositor of allotype female; 17, anterior apodeme of abdominal sternum VIII of same; Figs. 14-17 at 60 $\times$  magnification.



perceptibly smaller, 0.03-0.04 mm across and not as distinctly flat-bottomed. Punctures of elytra deep across base, shallower behind, ca. 0.03 mm across and 0.05 center to center, round-bottomed, closer to 0.04 mm across near base, evenly distributed. Pubescence of upper surface slightly curved, decumbent, ca. 0.07 mm long, fairly inconspicuous because it is not at all flattened and is concolorous with cuticle. Antennae with moderately dense suberect setae ca. 0.05 mm long from segment 2 to apex, a few such setae on first. Punctures of underside of thorax more rugulose, fairly shallow, ca. 0.02-0.03 mm across; those on abdomen smaller and finer, more distinct from each other, ca. 0.02 mm across and 0.03 center to center.

Female. Known only from allotype, 4.6 mm long. Antennae generally shorter and less slender, without the suberect setae of the male. Unfortunately, most of antennae lost after description. Measurements in 0.01 mm, base to apex: 55/20, 34/16, 44/15, 50/15, 49/15, 46/15, 47/15, 42/15, 39/15, 32/15, 54/15. Last segment with little indication of the change of thickness seen in the male. Eyes distinctly smaller and noticeably narrower than in male. Maxillary palpi smaller, last segment 0.24 mm long, 0.29 in male holotype, which is slightly smaller.

Holotype male, allotype female and 11 male paratypes, Big Bend N[ational] P[ark], TEX[AS], 1850', Boquillas, May 23, 1959, light; Howden & Becker; 3 male paratypes same but May 13. Holotype, allotype, and 11 paratypes in Canadian National Collection, 3 paratypes in collection of author.

Discussion. If this beetle is really a member of the family Meloidae, it is probably one of the most primitive yet discovered. Of the features that Selander (1966) lists as common to all meloids, including Eleticinae, *Thambospasta* conforms in only three: head with a well-developed vertex and narrow neck; pronotum not bordered laterally [with exceptions in Nemognathinae]; and female gonostyli one-segmented. It resembles Eleticinae but not the other subfamilies in that the cuticle is more heavily sclerotized; abdominal sternum III is excavated and margined to accommodate the hind coxae; the female has a distinct ovipositor; and in the following characteristics of the venation of the hind wings: vein  $2A_2$  present and joined to  $1A$  by a crossvein (also in Meloinae: Lyttini: Prolyttina); and  $3A_1$  connected to base of  $3A$  (in Eleticinae except Spasticini: Protomeloina and in some non-eticines, apud Selander). It is very similar to Eleticinae: Spasticini: Anthicoxenina in that the male gonostyli are fused dorsally at the base and have a median dorsal projection; this

feature is unknown elsewhere in the family. It is more like Meloinae and Nemognathinae than Eleticinae in that the apices of the elytra are not swollen and provided with a pit in the male (as they are in all Eleticinae but Spasticini: Anthicoxenina: *Iselma*).

It would be difficult to associate *Thambospasta* with *Iselma* in the Eleticinae on the basis of the similarity of the male genitalia and lack of elytral pits, because *Thambospasta* males have abdominal tergum VIII heavily sclerotized and would therefore become associated with Eleticini, the other tribe in the subfamily in Selander's classification. It differs from all Eleticinae in that vein  $2A_2$  of the hind wings is joined to the base of  $2A$ , a condition approached in some Eleticinae, however, and in being nocturnal rather than diurnal, as the few Eleticinae for which records are available seem to be. If Selander's  $2A_3$  of the Nemognathinae: Nemognathini: Zonitina: *Pseudozonitis* were counted as a primitive vein, rather than a specialization as he argues (1966), that genus would also have  $2A_2$  joined to the base of  $2A$ .

Returning to the features that Selander lists as being shared by all subfamilies of Meloidae, *Thambospasta* differs in several probably important ways: fore coxal cavities open externally but closed internally (open in all others); female abdominal sternum VIII with a long anterior apodeme (none at all in others); last segment of maxillary palpi narrowly securiform (never securiform in others); and cross-vein  $r$  apparently present (never in others). It also is unlike most Meloidae in that the male genitalia lack a sclerotized ejaculatory rod (lacking also in Eleticinae: Eleticini: Eospastina: *Eospasta* and in many Nemognathinae); and in that the tarsal claws lack a process arising from the lateral side of the base (lacking also in some specialized Meloinae and Nemognathinae). A possible third feature is that the aedeagus lacks a hook on its ventral side at or near the apex, a condition that is universal in Meloinae and present also in part of the Eleticinae. A feature not mentioned by Selander that is probably universal in Meloidae is the lack of microspines on the tibial spurs such as are seen in *Thambospasta*.

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